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.. CONTENTS ..



EDITORIAL	290
NEW MEMBERS	291
COST ANALYSIS	294
REPORT OF THE PRESIDENT COST AND MANAGEMENT INSTITUTE	307
PROBLEMS IN VARIANCE	312
EXAMINATION QUESTIONS	315



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• EDITORIAL •

During the past few months a great deal of time has been spent on organization in respect to the Society's educational program.

The Student enrollment of the Society is growing very rapidly. Since the introduction of University lectures and correspondence courses steady progress has been made. A series of lecture courses in all available subjects are conducted by McGill University and McMaster University and the classes are well attended. The University of Toronto and Queen's University are supervising the correspondence courses.

It is common knowledge that, in these times of stress, the problem in regard to efficient and highly skilled staff is one which affects all types of enterprises. The Universities are no exception to the rule. In spite of the handicaps encountered all our tutoring bodies are doing an excellent job.

In each of the larger Chapters student bodies have been formed, and they are supervised usually by a Chapter Director whose responsibility it is to see that the students are well organized and that they receive all that their membership entails. The Director in charge of the students reports to his Chapter Directorate who in turn report to the Secretary-Manager of the Society. In this manner the students of our Society are given every encouragement and the maximum of co-operation possible.

It is with pardonable pride that the Senior members of the Society can refer to the Student Body, and in doing so they do not forget the debt of gratitude that is due to the Universities, and Student Directors who give freely of their time in this great work.

The Educational Syllabus recently issued by the Ontario Society and the one issued by the Quebec Society contain all the necessary information in respect to the courses of study conducted by the Universities on behalf of the Society. It is obvious that a great deal of time and study was required before this information was finalized. The members who were responsible for the setting up and printing of these booklets are to be congratulated on the presentation of the material contained therein.

L. J. B.

COST AND MANAGEMENT

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Back Numbers Wanted

The following back numbers of Cost and Management are urgently required:

August, 1934.

October, 1934.

May, 1935.

July, 1935.

August, 1935.

December, 1935.

Any member who can spare any of the issues listed is urged to mail same immediately to the Secretary.

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COST AND MANAGEMENT



J. A. TUPPER, R.I.A.

Sunland Biscuit Company Limited

President

The Society of Industrial Accountants of Alberta

Cost Analysis

By H. P. DUTTON

An Address Delivered Before the Detroit Chapter of the Society for the Advancement of Management at the Engineering Society of Detroit in the Horace H. Rackham Educational Memorial, Detroit, Michigan

In the cost system of a firm doing about a million dollars of business a year, a force of five bookkeepers labored to find the costs of each order, which they did correctly to the hundredth part of a cent albeit usually about six weeks after the event. A question as to what use was made of the figures brought a rather hurt reply. "Do you think a firm can get along without costs? The cost figures are used by the sales department as a guide in quoting prices." It sounded fair enough until it was learned that the sales department did not use these costs, but filed them away and forgot them. Over the years, and partly by inheritance from the figures of a subsidiary company, a scale of prices had been worked out that customers were willing to pay, all handily codified in a price list, and it was this list that governed prices. It would have been unkind to have compared that beautiful cost system to an excellent clock running accurately but without hands. The cost figures were useful of course in valuing inventory in the financial statements.

Since then I have more than once looked at cost systems with a somewhat jaundiced eye. They are expensive, and it sometimes seems as though firms without much of a cost system make as much money as their more orthodox brethren. And for all the cost of the cost system, it seems to be difficult to get the right answer. The president looks at the figures, throws up his hands and proceeds to settle the matter by his own rough guess, without benefit of clergy. Or, if he does take his accountant literally, he is apt to come out with such strange answers as the one Ray Perry tells about. He had sold a customer a fine new milling machine and stopped in to see how it was working out. The customer was friendly but vague, so Perry went back in the shop and asked the foreman. There stood the new milling machine, quite plainly gathering dust, while across the aisle was the old planer it was supposed to have displaced, busily if inefficiently plowing its way through a job the miller would have done in half the time. "Yes, it's a good machine, but you see the overhead is so high that it's cheaper to use the planer."

A similar story is told of the late James O. McKinsey. It seems that a client had a blast furnace for which, with a reduced market for pig-iron, the depreciation charge per pound of iron was so heavy that they would have lost money had they used it. So the furnace was standing idle. McKinsey made a deal. He bought a furnace for \$10,000, then sold it back for \$11,000. Everybody benefited by this transaction. McKinsey received in his profit a reasonable fee for an hour's work. With the furnace on the books at \$11,000, it was now possible to take business at a profit, and the furnace went back into production. Of course, the firm dropped quite a little on the sale of the furnace but, since it was rusting away in

COST ANALYSIS

idleness anyway, it may well be argued that it was better to take business at a figure which returned at least a fraction of the original investment, than to lose it all.

Perhaps I am guilty of having a little fun at the expense of the cost accountant. But there do seem to be certain weaknesses in the system of accounting to which we have been brought up, and it is the purpose of this paper to see whether weaknesses can be corrected.

Most of us are familiar with the idea of the flexible budget, for which credit should go to John H. Williams, whose article "A Technique for the Chief Executive" appeared in the *Bulletin of the Taylor Society* in April, 1922. We all know that if one analyzes the expenses of a normal business, he finds that they break down into a part which remains almost constant (within normal volumes), regardless of the volume of sales, and a part, including such expenses as material and labor, which increases or decreases more or less in proportion to sales. Modern budgeting is a fairly accurate tool because it recognizes the reality of this mixed relationship between costs and volume, recognizes that the business is committed to certain types of expense, which can only be reduced by going out of business or by similar steps taken only in emergencies.

It is the fallacy of our traditional cost accounting systems that they fail to recognize this mixed nature of expense and, in their eagerness to trace every penny of expense back to its cause, treat all expense as if it was variable. The remedy for this difficulty is, fortunately, neither too complex nor too radical. In fact, it seems to be simpler to understand and less laborious to compile than the usual job or standard costs.

Let us examine a little more closely the nature of expense. You will pardon the use of small sums and simple figures for illustrations and some over-simplifications of details to bring out the point.

Any manufacturing business is in the nature of a speculation. One buys popcorn and a popper, trundles the popper to a likely corner and proceeds to turn the corn into finished product, package it and sell it to the public. That is, unless he is very unlucky, he sells the bag of popcorn for more than he paid for the raw corn, the bag and the butter. The difference between these costs and his selling price is a gross profit; only when the sum of these gross profits is sufficient to repay the cost of his popper, can he say that the venture has paid. Nor can we forget the inevitable costs of maintaining the establishment, the peddler's license, the free bags to the policeman, all the various expenses which go on whether business is good or bad. These costs are a fixed charge against the profits of any period.

The time to study costs is before the money is spent or committed. Your company is thinking of adding a machine. That is the time to sit down and figure out very carefully, what the initial expenses and the other fixed commitments will be, what the gross profit per unit will be and how many units you can expect the machine to produce and the market to absorb. That is the time to see whether the money would not yield more if put to some other use. A firm recently considered adding to its building. A cost analysis showed that, with an expanding business and heavy taxes, they would have to take the money for the building out of working

COST AND MANAGEMENT

capital. The building would have yielded a profit, but inventory promised a better one and the firm decided to get along for awhile with the old building. That was cost analysis at the right spot.

Almost all business expenses are speculative. We buy steel and put it into the storeroom; every production man takes for granted the risk that the price may go down before the stock can be turned into money again. The price may also go up, a pleasant thought on which we would like to dwell longer. But speculative the investment is, whether prices go up or down.

We may buy steel in carloads, thereby increasing the risk but making a saving in unit cost. When we buy a machine, we are in a sense buying a large package of machine time, which we hope to combine with purchased materials and sell at a profit.

Many expenses, although spread out over the future in serial payments, are as irrevocable as though paid out in one lump sum in advance. Anyone who has tried to dispose of a lease on a no longer wanted building will understand this sad fact.

The place where the accountant can really perform a service is in giving his boss a realistic and accurate estimate, before the money is spent or the commitment made. The form of such an estimate is simple. One sets down, year by year, an estimate or budget of the cost and the yield of the proposal under consideration, or the comparative costs of alternative proposals, over the whole period. If the time is long and the amounts large, there are ways for including in costs, appropriate allowances for interest, or the profit which might be made by other uses of the money. One then adds up and finds whether the proposition will pay. A simple cost comparison is shown below. One has a temporary demand for a product, for three years, with sales of \$1000 per year. Current, out-of-pocket costs of manufacture will come to 50% of the selling price and an investment of \$1000 must be made to start operations.

Figure 1. Cost Comparison

Year	Cost	Income	Net Profit
0 initial cost	\$1000		
1 operating cost	500	\$1000	
2 operating cost	500	1000	
3 operating cost	500	1000	
Total	2500	\$3000	\$500

No account has been taken of interest in this comparison; it might have been included by reducing the revenues and payments in each year to equivalent present worths. This procedure is well understood and we need not digress from the main thread of our analysis for it.

This form of cost comparison may also be applied to any other business situation such as the question of whether or not to discontinue a product.

The cost comparison provides a safe and simple form for presenting the cost elements, but it does not yield a handy cost figure, good under any circumstances. As a matter of fact, there is no such figure, although the belief in such a figure is a favorite part of the mythology of American

COST ANALYSIS

business. Shown below is the familiar graph showing the relation between volume and sales.

Super posed on the usual graph of total costs for a period is, in dotted lines, a graph showing (to a different scale), the cost per unit of product at the various rates of output.

Figure 2.

Assuming the simple case of one product, the cost per unit would evidently decrease, as the constant cost is spread over an increasing number of units. The cost per unit would consist of the "variable" cost of labor and material, (which becomes constant as a per unit figure) plus a share of the fixed costs, which decrease rapidly per unit as one goes from very small to larger volumes, and would continue to decrease, although more slowly, all along the line.

The usual accounting procedure in finding the unit cost of a product is to add to the direct cost for labor and materials, a proportion of burden on some one of various bases. The theory in allocating burden is to find some simple measure of the incidence of the cost. Any practicable measure is bound to be an approximation. For example, it is often assumed, and sometimes may be true, that the amount of supervision, the investment in machinery, rental of floor space, inspection, stores-handling expense and so on are in proportion to the direct labor expended on a product. The total direct labor for the period (in hours, or in some systems, in dollars of labor cost), is then divided into the burden in dollars to get a rate in dollars per hour, or a percentage of labor cost, to be added for burden. Thus, with 10,000 labor hours at \$1 per hour, and \$20,000 in indirect expense in a given period (as a year) the burden rate would be \$2,000 or \$2

10,000

per labor hour. Or, using the labor cost basis, the burden charge would be 200% of the direct labor cost. If a job took 3 hours, the labor cost would be \$3, the burden \$6. This elementary theory is reviewed merely to fresh the memories of those who may not be dealing with costs regularly.

The hour basis gives somewhat distorted figures if some processes require a very heavy investment in equipment, while others do not. To meet this situation, the production center plan was devised. Under this plan, all those expenses, such as depreciation, power use and the like, which are peculiar to a single process, department or other unit of operation volume are converted into separate rates per hour, a rate for each center. Those expenses which apply to all processes or cannot be located separately are reduced to a general rate per hour as in the labor hour method. The rate for each machine or production center then consists of the local burden plus the general rate. To cost out a job, after the labor and material costs are posted, the rate for each machine is looked up and the job is charged for the hours each machine is used at its appropriate rate.

In all these systems the number of hours' use on which the rate is based, is taken as the normal use, or rate of output of the business, or production center, sometimes very carefully estimated to cover the average experience of the whole eleven-year swing of the business cycle. Since the indirect expense is mostly fixed regardless of volume within the normal

COST AND MANAGEMENT

operating range of the company, any substantial fluctuation in volume of sales will result in an under—or over—application of burden. In the older systems, any unapplied burden was carried over into the next period, resulting in the rather quaint situation that, as volume went down, costs and presumably prices went up. If this process were carried to its logical conclusion we would have zero sales at an infinite price. The more logical method is to charge over—or under—applied burden direct to profit and loss. Certainly if any element in business is speculative it is volume, and while there may be a certain utility in carrying profits or losses into the next period in the guise of over—or under—applied burden, we are deluding ourselves if we permit these figures to alter the true picture of the results of operations.

The accountant is here swayed by a conception which has persistently been attacked by the economist. The accountant starts with the conception of a stewardship of the funds of the owner and is diligent that every penny shall be accounted for, as of course it should be. But one does not, in real life, neatly regulate every cent of overhead up or down in proportion to volume. He commits himself in advance in the form of fixed investment and fixed charges, to a certain establishment and then tries to operate that establishment as near as possible to capacity and on as profitable business as possible.

Let us glance again at Figure 1. Suppose that, after the initial investment of \$1000 had been made, but before a stroke of business had been done, the investor found that, with the same \$500 of operating costs, all he could get for his product was \$600 per year. To simplify the case let us also assume that he could realize nothing from the initial investment except by operating it.

Figure 3 compares the results of operating, and of closing down.
Figure 3.

Year	If plant is operated		If plant is not operated	
	Cost	Revenue	Cost	Revenue
0 Sunk cost of equipt.	\$1000		\$1000	
1 annual operating cost	500	600	0	0
2 annual operating cost	500	600	0	0
3 annual operating cost	500	600	0	0
Total costs or revenue..	\$2500	1800	1000	0
Loss		700		\$1000

Would you discontinue the line after you had committed yourself to the initial investment? Evidently you would be \$300 better off by continuing. The case is identical with the cases of the new milling machine and the blast furnace. A miscalculation or a change in conditions has voided part of the value of the initial investment. The cost accountant, attempting to retrieve the initial investment by adding it to the cost of the product, would give a misleading answer in each of these cases. In each case, the right course of action is to disregard the past and look to future costs and future return only, (to marginal costs and revenues, as the economist would put it.)

Obviously, one could not continue to operate a business if he failed

COST ANALYSIS

on every speculation to recover his investment. The fault would be not in the figures but in the judgment of the initial situation. But any practical business man knows that he does not make an even profit on each line. He makes out nicely on one, not so well on another. The problem is to know at all times how much return above out-of-pocket costs, can be counted on from each. One can then cut off the lines which continue to soak up more than they return (unless the deficit is investment, which looks to eventual returns) can nurse along the lines which, while they may not realize initial hopes, are still contributing a little toward salvaging the original investment, and can steadily swing the energies and the re-investment of the business toward those lines on which the profit and the promise are the greatest.

We are concerned in this analysis with the accounting procedure. One need not emphasize that one looks beyond the details of to-day's profits or losses to the eventual result, and may continue, on faith alone, to sink money for years, in the confidence that if one hammers long enough at the same spot, the stone will break. But it is a matter of some import that the figures by which even such inspired vision must be guided, shall reflect the realities and not an unrealizable, conventional picture of the situation.

C. R. Cary delivered a paper* before the American Management Association in which he advocates a new type of income statement. Out of his approach there has been evolved for one company a statement, part of which is shown below.

Commodity Profits and Losses, for month of				19
Product line	Axles	Bearings	Centers	Total
Shipments	6000	\$3000	\$1000	\$10,000
Less:				
Prime Cost:				
Labor	2000	1000	200	3200
Material	1000	1000	500	2500
Total prime cost	3000	2000	700	5,700
Contribution to expense	3000	1000	300	4,300
Less:				
Expense				4,000
Profit before taxes				\$ 300

Let us set the same statement up, applying expense on a labor cost basis of distribution. The total labor cost is \$3200, the expense is \$4000 and the burden rate would be 125%. The statement of costs by products follows:

Product Costs With Burden for Month of				19
Product line	Axles	Bearings	Centers	Total
Shipments	\$6000	\$3000	\$1000	\$10,000
Material	1000	1000	500	2500
Labor	2000	1000	200	3200
Burden 125% of labor ..	2500	1250	250	4000
Total cost	5500	3250	950	9,700
Profit	500	—250	50	300

COST AND MANAGEMENT

The figures come out to the same total profit as before. One consolidating thing about this whole question is that, no matter how you divide and allocate the expenses, they must in the end come out to the same total.

But notice in Figure 5, that line B is losing money. If we drop it, profits should increase. But if B is dropped we lose the \$1000 contribution the line made to expense (See Figure 4), and the profit of \$300 becomes a loss of \$700. If one looks at the overall picture the facts are there by either reports but if taken at face value, Figure 5 is misleading.

*"The use of Product-Line Profit and Loss Statements in the control of a Multiple-Line Business", by C. R. Cary, American Management Association, Financial Management Series No. 66, 1941.

Figure 3 is a very simple and clear statement. It shows sales and out-of-pocket expenses for each product line, and the real contribution of the line toward the total burden expense. The statement would be more accurate if not only labor and material were segregated by lines, but also other variable expenses, such as supplies, clerical labor in handling orders, commissions on sales and the like. The principle here would be not to segregate expenses which apply equally to all products, nor to bother with over-refinements which cost more in clerical expense than they contribute to real control.

To produce a report such as Figure 3, labor and material expense would be collected by product as in present systems, either on a job order basis or a standard cost basis in jobbing businesses, or on the basis of payrolls and material purchases in one-product departments. Departmental expense might well be included with prime product costs in the latter case. Burden would not be distributed. By this omission the bookkeeping would be appreciably reduced.

Suppose one wishes to know, as a basis for pricing, the cost of a particular product. The prime cost can be had from the statement or from the accountant. To this prime cost one can add the necessary mark-up including desired profit. In this case, if one is satisfied with the 3% profit on sales used in the illustration, the mark-up (on labor cost) would be 4300 or 130%.

3200

If you were like most presidents you would tell the sales department, "We must get a mark-up of 150%" and you might be right, for there must be something for contingencies. Maybe it would be 200%. Whatever the mark-up figure, it is a simple one to carry in mind. When the job is important, or when one must sharpen his pencil and quote the lowest possible figure, he can call for an analysis such as Figure 1, and determine, for any given proposal, what the costs and the returns would be and at what point the proposition ceases to be worth while. Mark-ups could be differentiated by line, if there were wide differences in equipment costs. They would be computed much as with the production center basis of distribution, but would be used for estimates rather than applied to each job and balanced out. They would be corrected periodically by comparison with the actual overall payroll and other figures.

COST ANALYSIS

Notice that, with the overall mark-up figure, one comes out with the same result as would be given by the distribution of overhead. The mark-up might be on labor cost, as in the case just given, or on prime cost. For a company jobbing any substantial part of its line without remanufacture, the most accurate way would be to apply one mark-up to products carrying labor, another to those merely rehandled without fabrication. Again, the question is as to the advisable degree of refinement.

How is one to price inventories without a detailed product cost including overhead? Inventory costs may conveniently be carried in terms of two figures, direct labor cost plus material costs. When we total the investment in stock, we do it as a total labor cost plus the total of the material costs. To put this figure into our balance sheets, we add the proper mark-up, which in this case would be 125% on labor. Or for the value of any single item or group of items, the burden can be added correctly at any time by the same device.

It may well be argued, why not carry inventories at prime cost, on the balance sheet? Suppose for the business shown in Figure 4 we are carrying an inventory of axles equal to one month's shipments, or \$6000 at sales price. The prime cost of this would be \$3000, its cost, including the 125% mark-up on labor, would be \$5500. We decide to increase stocks to 2 months supply without increasing sales. At prime cost our investment would increase by \$3000, at cost including overhead, by \$5500. Which of these figures for the increase in investment is the truer? Sticking to our simplifying but approximately true assumption of a fixed monthly overhead, we have not spent \$5500 for the added inventory but only \$3000, the added material and labor expense. Overhead has not increased and therefore has not been invested in inventory. Clearly, if one wants to prevent his balance sheets from ballooning up with an increase in inventory, or shrinking with a reduction, he will use prime costs.

Prime cost does not, of course, give the "true" value of the inventory. Prime cost is a conventional figure, which has the advantage of reflecting more accurately the true nature of changes in the inventory. But neither does the usual cost figure, including overhead, give the true value of inventory. The true value of an inventory is what it will bring on the market, minus the costs of processing and disposal to the point of sale. If one wants to sell an inventory in bulk, he will normally turn to some approximation to this method of valuation to set a price. If he does not propose to retire from business, but expects to dispose of inventory by the normal flow of business, the inventory at prime cost flows smoothly into the cost statement shown in Figure 3, gives a gross profit from which expenses are deducted in bulk, and out comes exactly the same profit figure, for all practical purposes, as would be given by detailed allocation of burden. Why go to all the bother of allocation? It is always simpler to look expenses directly in the face, than to pro-rate, subdivide, spread and eventually lose sight of them.

A shift of inventory from an average or total cost basis to a prime cost basis of valuation would of course involve a substantial initial adjustment of the balance sheet, which might not be looked on with favor by the tax collector, unless a tax were paid on the value which disappeared in the transition. We have not made the transition, principally for this

COST AND MANAGEMENT

reason, but we have had enough experience to convince us that it is economical and perfectly practicable to carry the inventory at prime costs and make our overhead extensions in bulk instead of detail, when we want a figure for valuation purposes.

One point remains to be settled. Throwing depreciation, or any other large expense, specifically applicable to one product and not to others, into burden and taking it off in one lump sum would give a correct picture so far as totals are concerned but would tend to distort judgment as to the true costs and profits on the various lines. Where a labor hour basis of distribution would have been sufficiently accurate, the statement in Figure 4 would serve. Where the failure to distinguish depreciation costs would lead to distortion, the form of statement shown below may be employed to advantage.

Figure 16. Statement of profits and losses by commodity month of 19

Product line	A	B	C	Total
Shipments	\$6000	\$3000	\$1000	\$10,000
Less Prime cost:				
Labor	2000	1000	200	3200
Material	1000	1000	500	2500
Total Prime cost	3000	2000	700	5,700
Gross Profit	3000	1000	300	4,300
Less Depreciation ..	400	200	400	1,000
	<hr/>	<hr/>	<hr/>	<hr/>
Contrib. to Gen'l.				
Expense	2600	800	—100	3,300
Less: Gen'l Exp.				3,000
	<hr/>	<hr/>	<hr/>	<hr/>
Profit before taxes				300

Depreciation is in this example figured on the common basis of time rather than use. Where equipment is certain to be used up before it becomes obsolete, depreciation might well be treated as a variable expense, but shown separately as above.

In this illustration, depreciation is shown as a fixed amount; this corresponds to the facts. A machine is bought on the basis of a certain probable activity or yield. If this use of the machine is not obtained, the unused portion of the capacity is water over the dam. Putting the statement up in the form shown in Figure 6 shows the true facts. It also separates depreciation costs, which are sunk, from the out-of-pocket costs, such as material and labor. Looking at product C, the executive sees that it is not realizing the depreciation chargeable to it. At the same time he sees that the income from C is \$300 greater than if it were discontinued. If it is possible to employ the capital and energies given to C in increasing the sale of A, it would other things being equal, certainly be advisable to do so. The income from C must be regarded as in the nature of a salvaging operation, getting what one can out of a disappointing speculation or a by-product utilization of capacity temporarily idle. The equipment for C will not, unless conditions change, be replaced when it wears out but meanwhile it will be operated.

COST ANALYSIS

Little has been said in this discussion, of the use of costs as a basis for pricing. Economists argue and I think most business men will agree that the individual firms costs in a competitive market have little to do with the price at which a product is sold. Price is determined by the necessities of the other fellow, by the costs of the marginal producer, who will drop out, curtailing the supply and holding or forcing up the price a little, if the price drops below the level at which he can compete.

We note at once one significant implication of the idea of marginal cost. If a producer finds himself in a market in which he cannot recover his fixed costs, it will be better for him to sell at any cost above his out-of-pocket costs, than not to sell at all. If the demand for the product is inelastic, this means that such a producer will tend to bid down prices to the barest minimum above out-of-pocket costs, where it might have been just as easy to obtain the higher price as the lower. Obviously it would be to the advantage of the producers to get together, agree on a price and thus reduce the losses that would follow ruinous competition, which is apt, in the heat of battle, to cut even below marginal costs and drive nearly everyone out of business. There seems to be at least a suspicion that one purpose of trade associations is to effect (by legal means of course) the exchange of information which makes possible such similar action on prices. It would of course be a great help in securing such action if each member of the association followed a uniform cost system, applying, perhaps, at certain appropriate points, not only full allowances for overhead, but small margins of profit for handling materials, for instance, adequate reserves for various contingencies, and all other possible cushions against the unkind blows of fate.

Business experience certainly indicates the folly the pricing your goods too low. All you get for your pains is the suspicion that perhaps there is something wrong with the goods and they are worth as little as their maker seems to think they are. Yet I do not think owners and managers would suffer by a control such as Figure 1 and either Figure 4 or 6, would furnish, a control which gives, at less cost than by present methods, the facts on which to base a realistic price policy. Realistic pricing is based on judgment of the market; one's own costs are significant only in indicating whether or not one should take a particular kind of business at the available market price.

The problem of surpluses is one of the most threatening of the world's economic worries. Governments destroy little pigs, to hold prices up. One argument for wars is that they furnish employment for surplus labor. Producers cut down the production of basic commodities and return men to idleness, because they are afraid of a demoralization of prices. Workmen do a half day's work for a day's pay, limit entrance to the craft, in order by scarcity to maintain the price of labor. Each individual is eminently sane from his own point of view, and yet what a crazy world results from the interaction of these various sanities. The fact that a man is not a member of a labor union and cannot get a job does not seem to change very much his need for food, so we tax away from the employer and the union man, the profit differential his monopoly has secured to him, in order to maintain in miserable and corroding idleness, the man whose work would compete with his. We look forward with the greatest anxiety

COST AND MANAGEMENT

to the return of the service men from the war; millions of young men at the height of their powers, men who have far more to give to their communities than they need ask of these communities for support, men whose return should be welcomed from the economic point of view, as well as because of gratitude for the heroic services they have rendered the Republic. Why should we be anxious about these additions to our productive capacity? They come as producers and customers as well as competitors. They will if we can only untangle the nightmare coils of our economy, supply their own needs and more. (This statement passes rather sweepingly over the admitted difficulties of readjustment, but it is well sometimes to disentangle oneself from detail in which it is easy to lose sight of realities.

One may well ask whether it is not time to switch our thinking, all of us, from the salvaging-of-the-past point of view of the historical or average cost system, to the more alert and flexible point of view of marginal costs. Marginal-cost thinking, if I may thus designate a general philosophy of pricing and policy, would be quicker to write off and abandon mistakes. One will of course, have to secure the same mark-up to stay in business under any type of thinking. But one would look at each situation from the standpoint of the best future utilization rather than an inflexible recovery of past commitments. There would still be some need presumably, for concerted action against uninformed price cutting. But better information, it may be hoped, would tend more to attack the problem of misplaced capacity at its source, and reduce the need and waste of ruinous price cutting by more foresight as to demand and knowledge of existing capacity. It would permit a more alert and flexible utilization of capacity, by price concessions during off seasons in order to stimulate demand, by intensive development of by-products, and by other means recognized as being profitable as well as socially desirable. Brains, skill, imagination, individual initiative would not suffer but would gain from such a loosening of the restrictions on competition. Money mis-invested would be lost more rapidly, but the returns would be correspondingly higher for the prudent investor. If we priced to stimulate demand the idle would find work and we would be relieved of the crushing load and fear of unemployment much sooner and more safely.

There is one great and simple truth that is easily lost sight of. When more is produced, there will be more to divide. To the extent that the attempt to hold up prices leads to the reduction of production and the waste of capacity, human as well as material capacity, to that extent we all suffer in the end.

Well, what started out as a prospectus for a cost report is rather getting off the deep end on social theory and it is time to stop. But I believe the social implications of marginal-cost thinking hold no social thread. To the contrary. Such thinking and accounting also conform to the realities which business men do consider in policy making.

A cost obtained by the conventional methods of distribution of burden has the virtue of simplicity. It is just one cost, and one does not have to worry about its being one thing in one set of circumstances and another in another set. You and I know how irritated the president of the com-

COST ANALYSIS

pany is when we say, "Well, the cost was \$2.056 last month but it is \$6.139 on this last lot." What can a man count on, anyway? Say something and stick to it.

I submit that in this specious simplicity lies the weakness of expense distribution. For a given distribution is correct only in a single set of circumstances, for a single volume, and the conditions in business are not that constant.

Also, as the ratio of indirect to direct expenses continually increases, the use of a simple labor base or even a production center base, rests on a narrower and narrower, less and less secure foundation. It is time we took our whole theory of cost finding apart and examined it in the light of our modern knowledge of fixed and variable expense, and of modern theories of marginal costs. This paper proposes a very modest step toward better cost analysis which has served to aid one firm, at least, to better decisions. The plan is submitted for criticism and in the hope that it may lead to further advances, from which we all may profit.

COST AND MANAGEMENT

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COST AND MANAGEMENT

Cost and Management Institute

Report of the President

For the Fiscal Year Ended on April 30, 1944

Fellow Members:

It is indeed a privilege for me to submit to you my annual report of the affairs of the Institute for the fiscal year ended on April 30th, 1944, and to be able to advise that your Institute has made definite progress in the course of that period.

Membership

At the beginning of the year, our membership stood at 196 made up of 120 resident members, 37 non-resident members and 20 students. In addition, there were 3 honorary members and 16 on active service. An intense membership campaign was launched by your Executive and thanks to the co-operation and assistance of our members, I have pleasure to report that our membership now stands at 252 as follows: 142 resident members, 55 non-resident and 37 students, plus 2 honorary members and the 16 on active service. This is an increase of 56 members over last year or the equivalent of 35%, and I feel justly proud of such an achievement. This healthy growth is evidence of the fact that the Institute has a definite place in our highly industrialized economy, that our members are alive to the necessity of broadening their contacts and increasing their strength and also that the aims and ideals of the Institute appeal to a larger number of business men. We all realize that cost accounting and industrial management are of great importance in modern business and will be in greater demand after the War.

Our efforts to increase our membership should be constant and almost obstinate. Membership, unlike gardening, is not seasonable, but is a flower that will bloom throughout the year if you will give it the care and attention it requires.

Financial Position

The other important feature of the activities of your Institute has been the healthy condition of its finances in the course of the year just ended. A separate report will be submitted in detail, but I would like to point out that in the course of the past twelve months we have been able to retire in full the outstanding loan which existed at the beginning of the year and to wipe out the expenses which had been incurred in the organization and incorporation of your Institute three years ago. After payment to the National Office of one half of the membership dues, your Executive used the rest of the funds for our activities.

An innovation which cost a little money this year was that rather than increase the price of the dinner, we paid the hospital tax on all meals served at the Mount Stephen Club prior to our regular meetings and also contributed gratuities for the table service. This means that for each attendance at our meetings last year, a minimum of 10 cents per person had to be disbursed out of the general funds of the Institute. That policy was adopted by your Executive at the beginning of the year in the hope that

COST AND MANAGEMENT

our members would continue to attend our dinners and be on hand for the meetings afterwards.

Activities

Our activities for the season 1943-44 were officially inaugurated by our Opening Dinner which took place in the Rose Room, the Windsor Hotel, on November 5th, 1943, whereat we had the privilege of having with us Mr. Henry Borden, K.C., Chairman of Wartime Industries Control Board, Ottawa, who spoke on "Co-ordination of Controls."

This meeting will go down into the annals of the Institute as an outstanding success both from the point of view of the quality of the Speaker and for the number of members and guests in attendance. In fact, we had a total attendance of 275, the highest mark reached so far. At the head table were representatives of some of our largest industries, as well as representatives of the important civic and business associations of the Province. The Speaker was quoted freely by the newspapers of the country and I like to think that the Cost and Management Institute did not feel any worse for it.

The regular program of the season was as follows:

October 29th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Cost in the Pulpwood Industry."

Speaker: W. T. Bennett, Asst. Treasurer—Brown Corporation.

November 12th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Post-War Planning by Business."

Speaker: George S. Mooney, Co-Director, Greater Montreal Economic Council.

November 26th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Joint Labour and Management Committees."

Speaker: E. R. Complin, Manager of Personnel, Defence Industries Limited.

December 10th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Job Evaluation."

Speaker: Dr. Herbert Moore, Member Senior Staff, Stevenson & Kellogg Ltd.

January 14th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Payroll Accounting."

Speaker: W. Holmes, Cost Accountant, Howard Smith Paper Mills Limited.

January 28th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "The Role of the Cost and Industrial Accountant in Postwar Planning."

Speaker: H. M. Hetherington, R.I.A., Viceroy Manufacturing Company Limited.

February 11th—Dinner and Student Night—Mount Stephen Club.

Program: A—Special Depreciation Claim to the W.C.D.B.

B—Intelligence Contest—C. A. Students Society Four Year McGill Accounting Class Students of C. & M.I.

February 25th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Responsibilities of the Personnel Manager."

Speaker: George Walsh, Personnel Director, Canadian Car & Foundry Co. Ltd.

REPORT OF THE PRESIDENT

March 10th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Value of Labour Unions to Industry."

Speaker: Dr. Finer of the International Labour Office.

March 24th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject "Differential Cost Accounting."

Speaker: Paul Kellogg, L.C.M.I., M.E.I.C., President Stevenson & Kellogg Ltd.

April 14th—Dinner and Lecture Meeting—Mount Stephen Club.

Subject: "Safety Engineering and Management."

Speaker: T. H. Miller, Assistant Manager, Quebec Association for Prevention of Industrial Accidents.

May 12th—Closing Dinner and Annual Meeting—Mount Stephen Club.

The total attendance at the above lecture meetings was 530 or an average of 48 persons.

In addition to the regular meetings, your Council held 17 meetings with a total attendance of over 200.

All of the lecture and most of the Executive meetings were held at the Mount Stephen Club, 1440 Drummond St., Montreal, and our thanks go to the management and to the staff of the Club for the efficient and courteous manner in which we were looked after at all times. We were very sorry indeed last Fall not to be able to go back to the Faculty Club as they had decided to reserve their facilities for their members only but, on the other hand, were very fortunate in being able to make arrangements with the Mount Stephen Club.

Educational Activities

The life line of any organization of our type is its students and it is a pleasure for me to report that the activities of that department have been very satisfactory. The Chairmanship or direction of these activities is in the hands of one who ought to know how, Mr. Don Patton, C.A., a past President of this Chapter, a past President of the National Society and a Professor at McGill University.

Our students numbered 38 as compared with 20 last year, while several of our members studied various subjects of cost accounting and business management without registering as such. Forty-one candidates have registered for examinations and will write 69 papers and on behalf of the Executive and of our members, as well as in my own name, I would like to wish them the best of success in their examinations and assure them that they can count on the support of their fellow members at all times.

Relations With Other Societies.

The relations of your Institute with its sister Societies have been most cordial and as such, contributed to maintain and perhaps increase the prestige of our Institute in the business community. Your President was officially invited to represent you at the annual functions of the Canadian Credit Institute on November 10th, 1943, at the Queen's Hotel, of the Society of Chartered Accountants of the Province of Quebec, on March 24, 1944, at the Ritz Carlton, of the General Accountants Association on April 22, 1944, at the Windsor Hotel and of the Chartered Institute of Secretaries on March 16, 1944, at the Windsor Hotel. In addition to the above, your Chairman, as a Director of the Chamber of Commerce, repre-

COST AND MANAGEMENT

sent the Institute on more than one occasion, thus creating the kind of publicity likely to reflect favourably upon our organization and its activities as well as on its membership.

I might also add that on the recommendation of the Educational Committee, certain mutual concessions are being worked out between the C.G.A.'s and the C.M.L.'s regarding examinations and I trust that these arrangements will prove to be of mutual advantage. The spirit of co-operation which prevailed throughout the year between your Society and its sisters was evidenced last Winter when the Quebec City members of the Institute were ready to organize a local chapter, but would rather postpone the matter than hamper the activities of the C.G.A.'s in that City, since a great number of our own members were already members of the local Chapter of the C.G.A. I hope that these happy relations will continue in the future since peace and harmony without is no less desirable than peace and harmony within.

Quebec City Chapter

The idea of forming other chapters in this Province is not new and attempts were made in that direction in the past. This year, however, with the help and co-operation of your Executive, your President endeavoured to organize our Quebec City members into a local Chapter. Accompanied by some of the past Presidents, he attended two meetings in Quebec City, one on May 31st, 1943, and the other on January 27th, 1944. The first one was addressed by Mr. P. W. Wright and Mr. Lorenzo Belanger, both Dominion past Presidents and by your own President. The meeting of January 27, 1944, was held jointly with the members of the C.G.A. in Quebec City and was addressed by Mr. H. M. Hetherington, the National President of the C.S.C.A. & I.E. and by the National Secretary, Mr. R. Dawson. On both occasions, a pressing appeal was made to the Quebec City members to organize a local chapter and I have much pleasure to report that they have decided to do so.

In this connection, representations were made to your Council to the effect that special arrangements be made whereby Quebec City residents who were members of the Institute as at December, 1943, could obtain the degree of L.C.M.I. after passing successfully the prescribed examinations. The principle was adopted by your Executive and a special Committee was formed for the purpose of supervising the examinations and their report will be available shortly.

For all purposes, the Chapter at Quebec City is virtually formed and all that is required now is its formal recognition as such. Your Council has assured the Quebec group of our desire to help in every way possible and I trust that you will give your new Council your full support along those lines.

The formation of the Quebec Chapter has raised the question as to whether it will be necessary or even desirable to form a Montreal Chapter as separate from the Institute proper. A special Committee was appointed by your Executive to go into the matter and their report was to the effect that a Montreal Chapter should be formed. No doubt that this matter will be submitted to you later.

REPORT OF THE PRESIDENT

National Meeting—C.S.C.A. & I.E.

As you probably know, the annual meeting of the Canadian Society of Cost Accountants & Industrial Engineers will be held in Quebec City on June 30th, 1944, the National Directors having thus accepted the invitation extended to them in June of last year by your President, at the Windsor, Ont., meeting. The details of the program are in the hands of the National Secretary, Mr. R. Dawson, and of Mr. A. J. Dolbec, a member of your Council and head of the Quebec group.

It will be the first time that the National Society have met in Quebec City and this will coincide with the inauguration of the Quebec City Chapter. A large party from Ontario is expected to leave here by boat on the evening of June 29th to arrive in Quebec in the morning of June 30th. The Directors' meeting will be held in the afternoon while the Dinner meeting will be held at the Chateau Frontenac in the evening, with an outstanding Guest Speaker. May I extend to you a most pressing invitation to arrange to attend this meeting. It will be most instructive and interesting. After all, we should give our Quebec City fellow members all the support we can and if you arrange to take your wife with you, I am sure that our Quebec City friends will make your stay very enjoyable as they have a wonderful program under consideration.

Conclusion

In conclusion, may I be permitted, after a retrospective glance over the progress made by your Institute in the course of the past twelve months, to try and scan the future. The foresight and wisdom of the pioneers of our Society have been proven by the progress which the Cost and Management Institute has made since its foundation. Its membership has grown steadily, its financial position is very sound and its influence is now felt in every corner of the Province. A new unit has been formed in the old Capital, another one is expected to be formed here and members located in the St. Maurice Valley, as well as those residing in the Eastern Townships will want to organize local chapters.

The degree of L.C.M.I. is recognized not only in this Province, but throughout Canada and some of our members who practise as public business consultants are proud of the fact that they belong to our organization. Your Society is being recognized by the sister organizations in the accounting and executive fields and our members rank on the same level as experts in other branches. The publicity which your activities have received has made your Institute known to a larger number of people.

The high standard of our educational requirements and the calibre of our meetings and discussions tend to increase the influence and prestige of your Society and I feel that we are travelling in the right direction and that we shall soon start to reap the benefits which are bound to accrue from such a policy. The services of Cost Experts as well as the services of men trained for industrial and business Management will be in greater demand after the War, since they will be essential to the success of private enterprise. If these premises are sound, the role played by your Institute and by its members is of paramount importance. Let us, therefore, better ourselves and thus create a demand for our services by extending our activities beyond the limits of our present membership. Let us, also, promote the interest and welfare of our profession at all times.

COST AND MANAGEMENT

Before closing, may I express my thanks to the members of your Executive and to the Chairmen of the various committees for their splendid co-operation and constant devotion to your interests. Thanks also to our genial Assistant Secretary-Treasurer, Mr. Randall Herron, whose services were very much in demand this year and who discharged his duties with the greatest efficiency. And last, thanks to you all for your wonderful support which made my task very light and very pleasant indeed.

All of which is respectfully submitted.

CHARLES P. DUMAS, M.C.I., L.C.M.I.,

President, 1943-44.

May 4th, 1944.

Problems in Variance

By Phil Glanzer, A.M.I.E.T., F.A.S.A.

The accounting term "Variance" is unknown to many printers. What is its relationship to costs and why, they ask.

Variance is the difference between standard or budgeted costs and actual costs. In the final analysis, it is the measurement of one's managerial efficiency. Many printers are perplexed by variance because they do not budget or use standard costs.

When variance is explained to them, many want to know why it is necessary to determine it. "Why not just record actual costs and let it go at that?" they ask. The printer who operates in this manner—and many do—can determine actual costs, but these costs do not aid efficiency on current operations; they merely record the degree of prior operating efficiency. To police current operations with adequate cost control, the printer must budget, and his estimated costs may show a variance with actual costs; in fact, they usually do. Any printer who can consistently make budgeted figures agree with actual results is a super-businessman, yet, it is still wise to attempt to reach Valhalla. By making the effort one will earn more profit than by side-stepping it.

In any industry, where job costs are to be computed, the burden rate must be worked out in advance. One can't use prior-period costs because they may vary with current costs, particularly, at a time like this, when costs are on the upswing. Should costs go down in the postwar period, the same condition prevails. If one costs too low on an upswing, he will cut profit. If he costs too high on the downward trend, he will lose sales. In both instances, one loses money. At any rate, budgeted costs are prior-period figures modified to agree with a forecast of things to come, an expectation of higher volume, higher costs or vice-versa.

Variance is concerned with the overhead chargeable to each job. As the work goes through the plant, it must be charged with a fair proportion of the burden. The difference between what one estimates the burden should be, based upon past-experience figures and a forecast of things to come, and what that burden actually is, when he computes costs at the end of a period, is the variance.

In the printing industry, overhead is usually distributed by the labor-hour or machine-hour method and that means the printer must estimate the labor hours or machine hours his plant will operate for a forthcoming

PROBLEMS IN VARIANCE

period as well as the amount of overhead expense in dollars and cents. He then uses the resulting labor-hour or machine-hour rate in costing jobs as they go through the plant. If he estimates a man must work 10 hours on a job and the labor-hour rate for overhead is \$3, he adds \$30 to that job for burden and records this cost. If the printer is off the beam on his budgetary calculation, obviously the overhead computed on jobs done or work in process is out of line and he must adjust his records to agree with actual costs. This variance is determined when he totals all outlay for overhead at the end of a period and compares estimated overhead with actual. That adjustment should be made through a variance account.

Now what to do when the printer determines the variance. Some printers charge it to profit and loss and let it go at that. Unwise. Variance should be handled systematically through a variance account so that one has a clean-cut record for check-back and analysis at any time. One must remember that the purpose of variance is to improve managerial efficiency and to give one more accurate costs. Variance should be investigated to check loss-leaks and to enable one to adjust future budgets, if necessary, in line with his findings.

Variance between budgeted and actual costs may be due to:

1. Overhead estimated too high or too low.
2. Direct labor hours or machine hours estimated too high or too low.
3. Overhead unusually high because repairs or other intermittent expenses are always high at certain periods.
4. Overhead unusually low because repairs and intermittent expenses are usually low at certain periods.
5. Production high or low because of seasonal fluctuations.
6. Production unusually low because of unpredictable circumstances, such as strikes, boiler explosion, inability to get raw materials, etc.

In short, variance is due to incorrect budgetary estimates, seasonal fluctuations of sales or overhead, unusual conditions disrupting production. If variance is due to first two causes listed in the foregoing, it has been over-estimated or under-estimated or labor hours or machine hours under-estimated or over-estimated; hence, the overhead applied to production is too low or too high and the printer must bring his budgeted costs in line with actual costs at the end of a period by adjusting these figures on his books.

On the other hand, if investigation discloses that seasonal conditions create variance, a different procedure is necessary. The printer, by referring to past experience figures, should be able to spot-check seasonal fluctuations in sales or overhead and consider them when budgeting. In that event, over the year, the debit and credit variances will tend to balance each other, so the bookkeeping device used is an Overhead Expense Variance Account, which is debited or credited with seasonal differences between budgeted costs and actual costs. Unapplied overhead cost, overhead estimated too low, hence, not enough charged to production, will appear on the balance sheet as a deferred charge. Over-applied overhead cost, overhead estimated too high, hence, too much charged to production, will appear on the balance sheet as a deferred credit.

At the years end, any balance on the variance account should be closed to profit and loss, but if one prepares monthly statements he should charge

COST AND MANAGEMENT

only 1/12 or credit 1/12 of the variance to that month's business, otherwise, he will distort the costs for the year-end month. On the annual statement, one should add or deduct the variance to or from overhead expense increasing or decreasing the actual accounts, whenever possible. Some printers close out the balance on the variance account to surplus, but inasmuch as the debit or credit to this account represents unapplied or over-applied overhead expense it should be deducted or added to overhead at the year's end to bring the net profit in line with actuality. Variance eventually finds its way into surplus when the profit and loss account is closed to surplus or net worth.

High-overhead and low-overhead months should offset each other on variance at the end of the year if budgets are prepared accurately. Seasonal lows and highs will level off over the year because budgetary estimates are based upon annual costs, which take these peaks and dips into consideration. But unusual expenses, such as fire loss not covered by insurance, boiler explosion, strike, flood, etc., cannot be anticipated when preparing a budget. Such expenses should be charged directly to surplus because they are capital losses, not profit losses and should not disrupt budgetary procedure or distort cost analysis, which is an essential to adequate cost control. Too many printers rest on their laurels when they have recorded their costs. They should follow through with cost analysis to determine where they can improve budgeting, costing and operating efficiency, making comparisons with other periods to note cost trends, etc.

A comparison of the variance balances from year to year will give a good idea of how one is progressing on operating efficiency, how competent he is at budgetary preparation and how he can improve his budgetary technique. One should remember that he should provide only for normal overhead expense on his budgets which, of course, will include normal idle time so that production absorbs it in the overhead rate and it is charged to customers when they are given estimates on jobs.

The postwar period will bring radical developments in the printing field, new processes, improved machinery, better materials and that means that old experience costs must be "ash-canned." Pre-war costs on pre-war production cannot be used as guides for post-war costs on post-war production. One must build experience by working with new processes on new units means that he must do a better costing job in the post-war period if he expects to make the most of business opportunities in after-war years. Old costing methods which may have gotten one by before the war won't suffice any longer. Variance is an important factor in cost control. One should see that he understands it and applies it intelligently.

COST AND MANAGEMENT

Examination Questions

ADVANCED COST ACCOUNTING—MAY, 1944

Question 1. (12 marks).

Prepare for the Atlas Machine Grinding Co. a Flexible (Variable) Budget for its Operating Department "C", over a range of 60% to 140% production capacity at 20% intervals using your own figures.

Included in the expenses should be the following: Direct Materials, Indirect Labour, Supplies, Fuel, Light and Power, Compensation Insurance, Proportion of Service Department's Expenses, Rent, Superintendence, Depreciation, General Expense, Direct Labour. State for each caption the reasons for the figures submitted.

Question 2. (18 marks).

(a) Alton Manufacturing Co. accounting records are maintained on an Estimating Cost basis. The accountant has prepared from his books the statements which appear below.

Submit in Journal Entry form, with narratives, the entries which the accountant made in his books in order to abstract these statements. Use three Work-in-Process Accounts. Assume that there were no inventories at the beginning of the fiscal period.

(b) State the actual value, by elements of cost, of the Finished Goods inventory at the close of the fiscal period.

ALTON MANUFACTURING CO. SCHEDULE OF COST OF GOODS MANUFACTURED FOR THE MONTH

	Estimated Cost	Adjustment	Actual Cost
Material	\$16,000	\$ 400	\$16,400
Labour	17,500	1,190*	16,310
Manufacturing expenses	10,500	1,400	11,900
	<hr/>		<hr/>
	\$44,000	\$ 610	
Total Actual Manufacturing Cost			\$44,610
Less: Inventory of Work in Process			
Material	\$ 4,000	\$ 100	
Labour	2,500	170*	
Manufacturing Expense	1,500	200	
	<hr/>	<hr/>	
	\$ 8,000	\$ 130	\$ 8,130
Actual Cost of Goods Manufactured			<hr/>
			\$36,480

PROFIT AND LOSS STATEMENT

Sales	\$60,000
Cost of Sales:	
Cost of Goods Manufactured, as above	\$36,480
Less:	
Inventory of Finished Goods (Est. cost) \$ 6,000	

COST AND MANAGEMENT

Add: Adjust. Material	\$ 50		
Labour	170*		
Manufacturing Expense ..	200		
		80	6,080

Cost of Sales—Actual (adjusted) \$30,400

Gross Profit on Sales \$29,600

Question 3. (15 marks).

(a) State the difference between a Standard Cost system using current standards and one using basic standards.

(b) Using your own figures, submit for a three year period cost ratios, setting forth ratios between actual costs and (a) current standard costs, (b) basic standard costs.

Question 4. 16 marks).

The R Co. produces a chemical known as LZ. In the manufacture of this, a by-product TT results. For the period under review costs applicable to the manufacture of the product and by-product up to the point of separation of the two items were as follows:

Direct Materials	\$445,000
Direct Labour	316,000
Indirect Labour	38,000
Supplies	21,000
Sundry Expenses	30,000

The respective "after-separation" costs were:

	LZ Finishing Dept.	TT Finishing Dept.
Direct Materials	\$80,000	\$ 5,000
Direct Labour	65,000	6,000
Indirect Labour	3,000	1,500
Supplies	2,800	2,000
Sundry Expenses	4,200	500

180,000 lbs. of Direct Materials were put in process before separation. Of these, 10,000 lbs. were lost, 25,000 lbs. transferred to by-product Finishing, and the remainder to main product Finishing.

"After-separation" process reduced the weight of TT by 20%.

There was no material in process at the beginning of the period, but at the end of the period there was LZ in process amounting to 10,000 lbs., complete as regards Direct Material, and only 50% for other costs.

Prepare a manufacturing cost per lb. statement for main product LZ and for by-product TT.

Question 5. (14 marks).

(a) State four different forms of graphic presentation of cost data describing briefly the chief characteristics of each.

(b) Using your own figures, illustrate, by Graph, information for the three elements of cost of production of article "A", showing both actual and standard costs.

Question 6. (25 marks).

(a) The Willsel Manufacturing Co. submits to you the following information requesting that it be summarized and journal entries be prepared

EXAMINATION QUESTIONS

for their Standard Cost Accounting System for the 6 months ended 31st December, 1943.

1. Work-in-Process accounts are kept on a standard cost basis.

2. Standard Cost per 100 units.

Material—30 lbs. at \$2.00\$ 60

Labour—30 hours at .60 18

Manufacturing Expense—10 machine hours at \$3.50 35

\$113

3. Purchases for the period:

7000 lbs. at \$2.10.

10000 lbs. at \$2.00.

4. Direct Labour for the period:

14000 hours at .55.

2000 hours at .65.

5. Actual Manufacturing Expense incurred\$16,850

Budgeted Manufacturing Expense 17,500

6. Material put in processActual 14,100 lbs. Standard 15,000 lbs.

7. Labour hoursActual 16,000 hrs. Standard 15,000 hrs.

8. Machine hoursActual 4,900 hrs. Standard 4,500 hrs.

9. Machine hours budgeted—5,000 hrs.

10. Completed Units transferred to Shipping Department—40,000.

11. Units sold—37,500 at \$150.00 per 100.

Journal Entries should include transfers to not less than seven variance accounts.

(b) State the amount of each variance, and where it might be allocated at the end of the fiscal period.

*Credits.



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